

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 09/512,968
Filing Date February 24, 2000
Inventor David R. Hembree
Assignee Micron Technology, Inc.
Group Art Unit 2832
Examiner V. Nguyen
Attorney's Docket No. MI22-1363
Confirmation No. 5950
Client No. 021567
Title: Wafer Processing Apparatuses and Electronic Device Workpiece Processing
Apparatuses (As Amended)

RESPONSE TO FEBRUARY 17, 2004 OFFICE ACTION

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JUN 28 2004

To: Mail Stop Amendment
Assistant Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

TECH CENTER 2800

From: James D. Shaurette (Tel. 509-624-4276; Fax 509-838-3424)
Wells, St. John, P.S.
601 W. First Avenue, Suite 1300
Spokane, WA 99201-3828

Sir:

Responsive to the Office Action dated February 17, 2004, Applicant amends and
remarks as follows:

AMENDMENTS

06/24/2004 HVUONG1: 00000006 09512968

03 FC:1202

162.00 OP

EV372455438

In the Claims

Claims 1-63 are canceled.

64. [Previously Presented] A wafer processing apparatus comprising:
a wafer holder adapted to receive a wafer having an electrical coupling, the wafer holder including an electrical coupling configured to electrically couple with the electrical coupling of the wafer and communicate signals between the wafer and the wafer holder of the wafer processing apparatus for fabrication of integrated circuitry using the wafer processing apparatus.
65. [Previously Presented] The wafer processing apparatus according to claim 64 further comprising a data gathering device coupled with the electrical coupling of the wafer holder and configured to receive the signals.
66. [Previously Presented] The wafer processing apparatus according to claim 65 further comprising a contact plate configured to communicate the signal intermediate the wafer holder and the data gathering device.
67. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the wafer holder includes a first surface, a second surface, and an electrical interconnect configured to electrically couple the first surface and the second surface.

68. [Previously Presented] The wafer processing apparatus according to claim 67 wherein the first surface of the wafer holder is configured to face a received wafer and the second surface is configured to face a chuck.
69. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the wafer holder includes a plurality of electrical couplings adapted to couple with a plurality of electrical couplings of the wafer.
70. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the wafer holder comprises a chuck.
71. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the wafer holder comprises a chuck configured to receive one of a calibration wafer and a production wafer.
72. [Previously Presented] The wafer processing apparatus according to claim 71 wherein the wafer holder includes vacuum chambers adapted to receive a vacuum to couple one of the calibration wafer and the production wafer with the chuck.
73. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the wafer holder comprises an intermediate member adapted to couple with a chuck.

74. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the wafer holder includes a vacuum chamber adapted to receive a vacuum to couple a received wafer with the wafer holder.

75. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the electrical coupling of the wafer holder comprises a conductive column configured to extend outward from plural surfaces of the wafer holder.

76. [Previously Presented] The wafer processing apparatus according to claim 75 further comprising a contact plate including circuitry configured to provide electrical connection with the conductive column.

77. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the electrical coupling of the wafer holder is adapted to contact the electrical coupling of the wafer.

78. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the wafer holder is adapted to expose the wafer to a processing environment to process the wafer.

79. [Previously Presented] A wafer processing apparatus comprising:
a wafer holder having circuitry configured to communicate a process signal from a received wafer and the process signal containing information regarding processing of the wafer using the wafer processing apparatus.

80. [Previously Presented] The wafer processing apparatus according to claim 79 wherein the wafer holder is adapted to expose the wafer to a processing environment to process the wafer.

81. [Previously Presented] A wafer processing apparatus comprising:
a chuck including a surface, an electrical coupling adjacent the surface, and an electrical interconnect configured to connect with the electrical coupling of the chuck and conduct a signal within the chuck;
an intermediate member adapted to receive a wafer and the intermediate member having a first surface and a second surface and the intermediate member including:
an electrical coupling adjacent the first surface and configured to couple with the electrical coupling of the chuck;
an electrical coupling adjacent the second surface; and
an electrical interconnect configured to connect the electrical coupling adjacent the first surface and the electrical coupling adjacent the second surface; and
a wafer configured to couple with the second surface of the intermediate member, the wafer including a sensor and an electrical coupling configured to provide electrical

connection of the sensor with the electrical coupling of the second surface of the intermediate member.

82. [Previously Presented] The wafer processing apparatus according to claim 81 further comprising a data gathering device coupled with the electrical coupling of the chuck and configured to receive the signal.

83. [Previously Presented] The wafer processing apparatus according to claim 82 further comprising a contact plate configured to communicate the signal intermediate the chuck and the data gathering device.

84. [Previously Presented] The wafer processing apparatus according to claim 81 wherein the sensor comprises a resistance temperature device.

85. [Previously Presented] The wafer processing apparatus according to claim 81 wherein the wafer comprises a calibration wafer.

86. [Previously Presented] The wafer processing apparatus according to claim 81 wherein the electrical interconnect comprises a conductive column configured to extend outward from plural surfaces of the chuck.

87. [Previously Presented] The wafer processing apparatus according to claim 86 further comprising a contact plate including circuitry configured to provide electrical connection with electrical couplings of the chuck.

88. [Previously Presented] The wafer processing apparatus according to claim 81 wherein the intermediate member is configured to expose the wafer to a processing environment to process the wafer.

89. [Previously Presented] A wafer processing apparatus comprising:
a chuck including a surface, a plurality of electrical couplings adjacent the surface, and a plurality of electrical interconnects configured to connect with respective electrical couplings of the chuck and conduct signals within the chuck;

an intermediate member adapted to receive a wafer and the intermediate member having a first surface and a second surface and the intermediate member including:

a plurality of electrical couplings adjacent the first surface and configured to couple with respective electrical couplings of the chuck;

a plurality of electrical couplings adjacent the second surface; and

a plurality of electrical interconnects configured to electrically connect the electrical couplings of the first surface with respective electrical couplings of the second surface;

a calibration wafer configured to couple with the second surface of the intermediate member, the calibration wafer including a plurality of resistance temperature devices configured to generate process signals, and a plurality of electrical connections configured

to electrically connect the resistance temperature devices with respective electrical couplings of the second surface of the intermediate member; and

a data gathering device coupled with the electrical interconnects of the chuck and configured to receive the process signals from the resistance temperature devices through the intermediate member and the chuck.

90. [Previously Presented] The wafer processing apparatus according to claim 89 wherein the intermediate member is configured to expose the wafer to a processing environment to process the wafer.

91. [Currently Amended] An electronic device workpiece processing apparatus comprising:

a workpiece holder adapted to receive an electronic device workpiece having an electrical coupling, the workpiece holder including an electrical coupling configured to electrically couple with the electrical coupling of the electronic device workpiece and communicate signals between the electronic device workpiece and the workpiece holder during fabrication of integrated circuitry of the electronic device workpiece using the electronic device workpiece processing apparatus, wherein the workpiece holder includes a vacuum chamber adapted to receive a vacuum to couple a received electronic device workpiece with the workpiece holder.

92. [Previously Presented] The apparatus of claim 91 wherein the workpiece holder is configured to expose the electronic device workpiece to a processing environment to process the electronic device workpiece.

93. [Previously Presented] An electronic device workpiece processing apparatus comprising:

a workpiece holder adapted to receive an electronic device workpiece having an electrical coupling, the workpiece holder including an electrical coupling configured to electrically couple with the electrical coupling of the electronic device workpiece and communicate signals between the electronic device workpiece and the workpiece holder, wherein the electrical coupling of the workpiece holder is configured to extend outward from plural surfaces of the workpiece holder; and

a contact plate including circuitry configured to provide electrical connection with the conductive column.

94. [Previously Presented] The apparatus of claim 93 wherein the workpiece holder is configured to expose the electronic device workpiece to a processing environment to process the electronic device workpiece.

95. [Previously Presented] An electronic device workpiece processing apparatus comprising:

- a chuck including a surface, an electrical coupling adjacent the surface, and electrical interconnect configured to connect with the electrical coupling of the chuck and conduct a signal within the chuck;

- an intermediate member having a first surface and a second surface and the intermediate member including:

 - an electrical coupling adjacent the first surface and configured to couple with the electrical coupling of the chuck;

 - an electrical coupling adjacent the second surface; and

 - an electrical interconnect configured to connect the electrical coupling adjacent the first surface and the electrical coupling adjacent the second surface;

 - an electronic device workpiece configured to couple with the second surface of the intermediate member, the electronic device workpiece including a sensor and an electrical coupling configured to provide electrical connection of the sensor with the electrical coupling of the second surface of the intermediate member;

 - a data gathering device coupled with the electrical coupling of the chuck and configured to receive the signal; and

 - a contact plate configured to communicate the signal intermediate the chuck and the data gathering device.

96. [Previously Presented] The apparatus of claim 95 wherein the intermediate member is configured to expose the electronic device workpiece to a processing environment to process the electronic device workpiece.

97. [Previously Presented] An electronic device workpiece processing apparatus comprising:

- a chuck including a surface, an electrical coupling adjacent the surface, and electrical interconnect configured to connect with the electrical coupling of the chuck and conduct a signal within the chuck;

- an intermediate member having a first surface and a second surface and the intermediate member including:

 - an electrical coupling adjacent the first surface and configured to couple with the electrical coupling of the chuck;

 - an electrical coupling adjacent the second surface; and

 - an electrical interconnect configured to connect the electrical coupling adjacent the first surface and the electrical coupling adjacent the second surface; and

 - an electronic device workpiece configured to couple with the second surface of the intermediate member, the electronic device workpiece including a sensor comprising a resistance temperature device, and an electrical coupling configured to provide electrical connection of the sensor with the electrical coupling of the second surface of the intermediate member.

98. [Previously Presented] The apparatus of claim 97 wherein the intermediate member is configured to expose the electronic device workpiece to a processing environment to process the electronic device workpiece.

99. [Previously Presented] An electronic device workpiece processing apparatus comprising:

- a chuck including a surface, an electrical coupling adjacent the surface, and electrical interconnect configured to connect with the electrical coupling of the chuck and conduct a signal within the chuck;

- a contact plate including circuitry configured to provide electrical connection with the electrical coupling of the chuck;

- an intermediate member having a first surface and a second surface and the intermediate member including:

 - an electrical coupling adjacent the first surface and configured to couple with the electrical coupling of the chuck;

 - an electrical coupling adjacent the second surface; and

 - an electrical interconnect configured to connect the electrical coupling adjacent the first surface and the electrical coupling adjacent the second surface, wherein the electrical interconnect comprises a conductive column configured to extend outward from plural surfaces of the chuck; and

 - an electronic device workpiece configured to couple with the second surface of the intermediate member, the electronic device workpiece including a sensor and an electrical

coupling configured to provide electrical connection of the sensor with the electrical coupling of the second surface of the intermediate member.

100. [Previously Presented] The apparatus of claim 99 wherein the intermediate member is adapted to expose the electronic device workpiece to a processing environment to process the electronic device workpiece.

101. [Previously Presented] An electronic device workpiece processing apparatus comprising:

an electronic device workpiece including a sensor and an electrical coupling; and
an intermediate member including a surface having an electrical coupling and adapted to expose the electronic device workpiece to a processing environment to process the electronic device workpiece;

wherein the electrical coupling of the electronic device workpiece is configured to provide electrical connection of the sensor with the electrical coupling of the surface of the intermediate member.

102. [Previously Presented] The apparatus according to claim 101 wherein the electronic device workpiece comprises a wafer.

103. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the wafer holder is configured to support a wafer for processing within the wafer

processing apparatus to form a plurality of discrete integrated circuits of a plurality of respective dies to be singulated from the wafer at a subsequent moment in time.

104. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the wafer holder is configured to expose a wafer to a processing environment within the wafer processing apparatus to form a plurality of discrete integrated circuits of a plurality of respective dies to be singulated from the wafer at a subsequent moment in time.

105. [Previously Presented] The wafer processing apparatus according to claim 64 further comprising a processing area of the wafer processing apparatus configured to process a wafer supported using the wafer holder to fabricate a plurality of discrete integrated circuits of a plurality of respective dies to be singulated from the wafer at a subsequent moment in time.

106. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the wafer processing apparatus is configured to process a wafer supported using the wafer holder to fabricate a plurality of discrete integrated circuits of a plurality of respective dies to be singulated from the wafer at a subsequent moment in time.

107. [Previously Presented] The wafer processing apparatus according to claim 64 wherein the wafer comprises a semiconductive wafer comprising a plurality of integrated circuit dies prior to singulation of at least one of the dies at a subsequent moment in time.

108. [Previously Presented] An article of manufacture comprising:

a wafer processing apparatus configured to fabricate integrated circuitry using a plurality of wafers and comprising a wafer holder configured to receive at least one of the wafers having an electrical coupling, and wherein the wafer holder comprises an electrical coupling configured to electrically couple with the electrical coupling of the at least one wafer and to communicate signals between the at least one wafer and the wafer holder.

109. [Previously Presented] The article of claim 108 wherein the electrical coupling of the wafer holder is configured to contact the electrical coupling of the wafer.

110. [Previously Presented] The article of claim 108 wherein the communicated signals comprise information regarding processing of the wafer using the wafer processing apparatus.

111. [Previously Presented] An electronic device workpiece processing apparatus comprising:

an intermediate member comprising a first surface and a second surface, wherein the second surface comprises an electrical coupling; and

an electronic device workpiece including a sensor and an electrical coupling configured to provide electrical connection of the sensor with the electrical coupling of the second surface of the intermediate member.

112. [New] The wafer processing apparatus according to claim 64 wherein the electrical coupling of the wafer holder is electrically conductive to establish an electrical connection with the electrical coupling of the wafer wherein electrons of the signals are exchanged between the electrical couplings of the wafer holder and the wafer.

113. [New] The wafer processing apparatus according to claim 64 wherein the signals are generated using electrical circuitry of the wafer.

114. [New] The wafer processing apparatus according to claim 64 wherein the signals comprise electrical signals.

115. [New] The wafer processing apparatus according to claim 79 wherein the process signal comprises information regarding the processing of the wafer for fabrication of integrated circuitry using the wafer processing apparatus.

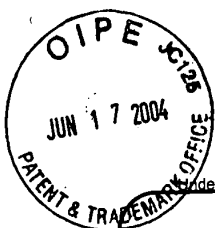
116. [New] The wafer processing apparatus according to claim 79 wherein the wafer holder is configured to receive the process signal comprising an electrical signal using an electrical coupling of the wafer holder in electrical contact with an electrical coupling of the wafer.

117. [New] The electronic device workpiece processing apparatus according to claim 91 wherein the communicated signals comprise information regarding processing of the wafer for fabrication of the integrated circuitry using the wafer processing apparatus.

118. [New] The electronic device workpiece processing apparatus according to claim 91 wherein the communicated signals comprise electrical signals.

119. [New] The article according to claim 108 wherein the communicated signals comprise information regarding processing of the wafers for fabrication of the integrated circuitry using the wafer processing apparatus.

120. [New] The article according to claim 108 wherein the electrically coupled electrical couplings of the wafer and the wafer holder are in electrical contact with one another to communicate the signals comprising electrical signals between the at least one wafer and the wafer holder.



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PTO/SB/21 (02-04)

Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	09/512,968
	Filing Date	2/24/2000
	First Named Inventor	David R. Hembree
	Art Unit	2829
	Examiner Name	V. Nguyen
Total Number of Pages in This Submission	Attorney Docket Number	MI22-1363

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ENCLOSURES (Check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> After Allowance communication to Technology Center (TC)
<input checked="" type="checkbox"/> Fee Attached	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input checked="" type="checkbox"/> Amendment/Reply	<input type="checkbox"/> Petition	<input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address	<input type="checkbox"/> Status Letter
<input checked="" type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Terminal Disclaimer	<input checked="" type="checkbox"/> Other Enclosure(s) (please Identify below):
<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Request for Refund	Return Receipt Postcard A \$ 452.00 Check
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<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53		

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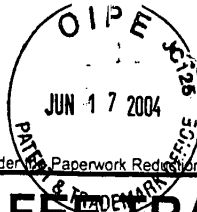
Firm or Individual name	James D. Shaurette, Reg. No. 39,833 Wells St. John, P.S.
Signature	
Date	6/17/04

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EV372455438



FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$)**452.00**

Complete if Known

Application Number **09/512,968**
Filing Date **2/24/2000**
First Named Inventor **David R. Hembree**
Examiner Name **V. Nguyen**
Art Unit **2829**
Attorney Docket No. **MI 22-1363**

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METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

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Deposit Account Number **23-0925**
Deposit Account Name **Wells St. John, P.S.**

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FEE CALCULATION

1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) (\$) **- 0 -**

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims **57** - 48 = **9** x **18.00** = **162.00**
Independent Claims **12** - 12 = **0** x **0.00** = **0.00**
Multiple Dependent

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1202	18	2202	9	Claims in excess of 20	
1201	86	2201	43	Independent claims in excess of 3	
1203	290	2203	145	Multiple dependent claim, if not paid	
1204	86	2204	43	** Reissue independent claims over original patent	
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent	

SUBTOTAL (2) (\$) **162.00**

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for <i>ex parte</i> reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	110.00
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	180.00
8021	40	8021	40	Recording each patent assignment per property (times-number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) **290.00**

SUBMITTED BY

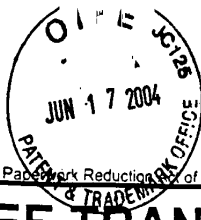
Name (Print/Type) **James D. Shaurette** Registration No. (Attorney/Agent) **39,833** Telephone **(509) 624-4276**
Signature **[Signature]** Date **6/17/04**

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PTO/SB/17 (10-03)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FEE TRANSMITTAL for FY 2004

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☒ Deposit Account:

Deposit Account Number 23-0925
Deposit Account Name Wells St. John, P.S.

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☒ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Small Entity

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1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
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1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	180.00
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1810	770	2810	385	For each additional invention to be examined (37 CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	2802	900	Request for expedited examination of a design application	

Other fee (specify)

Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$ 290.00)

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385	Utility filing fee	
1002 340	2002 170	Design filing fee	
1003 530	2003 265	Plant filing fee	
1004 770	2004 385	Reissue filing fee	
1005 160	2005 80	Provisional filing fee	

SUBTOTAL (1) (\$ - 0 -)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims 57 - 48 = 9 x 18.00 = 162.00
Independent Claims 12 - 12 = 0 x 0.00 = 0.00
Multiple Dependent

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
1202 18	2202 9	Claims in excess of 20
1201 86	2201 43	Independent claims in excess of 3
1203 290	2203 145	Multiple dependent claim, if not paid
1204 86	2204 43	** Reissue independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$ 162.00)

**or number previously paid, if greater. For Reissues, see above

SUBMITTED BY

Name (Print/Type) James D. Shaurette

Signature

Registration No. (Attorney/Agent)

39,833

(Complete if applicable)

Telephone (509) 624-4276

Date 6/17/04

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